

18. Describe the role of positive and negative modulators in allosteric enzyme regulation and its effects on enzyme activity.
 19. Describe the different mechanisms of enzyme catalysis with examples.
 20. Demonstrate the principle of glucose biosensor, its enzymatic reaction and the mechanism of glucose detection.
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NOVEMBER/DECEMBER 2025

23UBC51 — ENZYMES

Time : Three hours

Maximum : 75 marks



SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

Define linkage specificity in enzymes.

2. What is the turnover number (kcat) of an enzyme?
3. How is maximum velocity (V_{max}) determined from an Eadie-Hofstee plot?
4. Note the importance of V_{max} in enzymatic reactions.
5. What type of enzyme inhibition can be reversed by increasing substrate concentration?
6. Which type of enzymes typically produce a sigmoidal kinetic curve?

7. How do metal ions enhance enzyme catalytic activity?
8. Name two major types of coenzymes.
9. "Amylase improves the quality and shelf-life of baked products" Justify.
10. List the polymers used for enzyme entrapment.

SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL questions.



11. (a) Outline the steps involved in the isolation of an enzyme from a crude cell extract.

Or

- (b) Present on intracellular localization of enzymes with examples and their functions.
12. (a) Evaluate the effect of temperature and pH on enzyme activity.

Or

- (b) Describe the Lineweaver-Burk plot and explain how it is used to determine K_m and V_{max} .

13. (a) Compare and contrast reversible and irreversible enzyme inhibition with examples.

Or

- (b) Describe non-competitive inhibitors with examples and its effect on enzyme activity and enzyme kinetics.

- (a) Explain the coenzymatic roles of NAD/NADP and FAD/FMN in redox reactions.

Or

- (b) Illustrate the structure and function of the pyruvate dehydrogenase complex.

15. (a) Summarize the process of covalent bonding for enzyme immobilization.

Or

- (b) What is a biosensor? Describe its components and its role.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Classify IUBMB system for enzyme nomenclature and classification with examples.
17. Define enzyme kinetics and explain the factors that affect enzyme activity.